

ABSTRACT

An increase in the span of the transmission distance is aimed at by reducing unwanted ASE generated during optical communication. A carbon nanotube is employed as a saturable absorber 15 and this saturable absorber constitutes a noise reduction apparatus that has the function of cutting off or reducing transmission of unwanted ASE or the like which is of weak signal light intensity and of allowing transmission of signal light of strong light intensity. This noise reduction apparatus is arranged for example in the transmission path of 10 signal light of a bidirectional excitation type EDFA, more precisely the apparatus is inserted in the latter stage of the EDF 40. In this way, carbon nanotubes having a saturable absorption function can be utilized in the field of optical 15 communication.